

CLAIMS

What is claimed is:

1. A split torque gearbox system comprising:
a first spur gear mounted for rotation about a first spur gear axis of rotation;
a second spur gear mounted for rotation about a second spur gear axis of rotation;
and
a floating pinion meshed with said first spur gear and said second spur gear, said pinion gear mounted for rotation about a pinion axis of rotation, said pinion axis of rotation, said first spur gear axis of rotation, and said second spur gear axis of rotation located along a common line, said pinion gear axis of rotation displaceable off said common line to split a load between said first spur gear and said second spur gear.
2. The split torque gearbox system as recited in claim 1, further comprising a radially unsupported pinion shaft mounted to said pinion.
3. The split torque gearbox system as recited in claim 2, further comprising a face gear mounted to said pinion shaft.
4. The split torque gearbox system as recited in claim 2, further comprising a spiral bevel gear mounted to said pinion shaft.
5. The split torque gearbox system as recited in claim 1, further comprising:
a first double helical gear driven by said first spur gear, said first double helical gear defined along said first spur gear axis of rotation; and
a second double helical gear driven by said second spur gear, said second double helical gear defined along said second spur gear axis of rotation.

6. The split torque gearbox system as recited in claim 5, further comprising an output gear meshed with said first and second double helical gear.
7. The split torque gearbox system as recited in claim 6, further comprising a main rotor shaft driven by said output gear.

8. A split torque gearbox system for a rotary wing aircraft comprising:
an input shaft;
a face gear driven by said input shaft about a face gear axis of rotation;
a first spur gear mounted for rotation about a first spur gear axis of rotation;
a second spur gear mounted for rotation about a second spur gear axis of rotation;
and
a floating pinion driven by a pinion shaft mounted to said face gear, said floating pinion meshed with said first spur gear and said second spur gear, said pinion mounted for rotation about a pinion axis of rotation, said pinion axis of rotation, said first spur gear axis of rotation, and said second spur gear axis of rotation located along a common line, said floating pinion axis of rotation displaceable off said face gear axis of rotation to split a load between said first spur gear and said second spur gear;
a first double helical gear driven by said first spur gear, said first double helical gear defined along said first spur gear axis of rotation;
a second double helical gear driven by said second spur gear, said second double helical gear defined along said second spur gear axis of rotation; and
an output gear meshed with said first and second double helical gears.
9. The split torque gearbox system as recited in claim 8, further comprising a main rotor shaft driven by said output gear.
10. The split torque gearbox system as recited in claim 8, wherein said input shaft is driven by a gas turbine engine.
11. The split torque gearbox system as recited in claim 8, wherein said face gear defines a gear face perpendicular to said face gear axis of rotation, said input shaft angled relative said gear face.

12. A method of splitting torque within a split torque gearbox system comprising the steps of:

- (1) driving a floating pinion about a pinion gear axis of rotation; and
- (2) engaging the floating pinion with a first gear and a second gear, the first gear rotating around a first gear axis of rotation, the second gear rotating around a second gear axis of rotation, the first gear axis of rotation, the second gear axis of rotation and the pinion gear axis of rotation located along a common line, the pinion gear axis of rotation displaceable off the common line to split a load between the first gear and the second gear.

13. A method as recited in claim 12, further comprising the steps of:

driving a first double helical gear by the first gear, the first double helical gear rotating about the first gear axis of rotation and axially movable along the first gear axis of rotation; and

driving a second double helical gear by the second gear, the second double helical gear rotating about the second gear axis of rotation, and axially movable along the second gear axis of rotation.

14. A method as recited in claim 13, further comprising the steps of:

driving an output gear about an output gear axis of rotation with the first and second double helical gear.

15. A method as recited in claim 13, further comprising the steps of:

driving a rotor system about the output gear axis of rotation with the output gear.

16. A method as recited in claim 12, further comprising the steps of:

driving a face gear about a face gear axis of rotation with a high speed input shaft;
driving the floating pinion with the face gear through a floating pinion shaft.

17. A method as recited in claim 16, further comprising the steps of:
driving the high speed input shaft along an input shaft axis of rotation which is angled relative the face gear.

18. A method as recited in claim 17, further comprising the steps of:
driving a second face gear about a second face gear axis of rotation, the second face gear axis of rotation parallel to the face gear axis of rotation.

19. A method as recited in claim 17, further comprising the steps of:
driving a second face gear about a second face gear axis of rotation, the second face gear axis of rotation defined along the face gear axis of rotation.